Global Research in Higher Education
ISSN 2576-196X (Print) ISSN 2576-1951 (Online)
Vol. 8, No. 1, 2025
www.scholink.org/ojs/index.php/grhe

Original Paper

Exploration of Teaching Innovation Path in Universities under the Perspective of Digital Transformation

Jie Lu[1]

[1] Beijing Institute of Technology (Zhuhai), Zhuhai, China

Received: November 15, 2024 Accepted: December 9, 2024 Online Published: December 11, 2024

doi:10.22158/grhe.v8n1p1 URL:http://dx.doi.org/10.22158/grhe.v8n1p1

Abstract

With the development of information technology, digitalization has become a feature of the times, bringing opportunities and challenges to the reform of college curriculum. This paper explores the teaching dilemmas and challenges of college courses in the context of digitization, including the limitation of teaching resources, teachers' and students' dilemmas. Taking the econometrics course as an example, it proposes innovative paths, such as the application of new teaching technologies and tools such as rainy classroom and MOOC platform, the adoption of project-based learning and teacher-student co-construction mode. The study is of great significance, at the same time, the limitations of the study are pointed out, such as the scope of the study is mainly based on econometrics courses, and the methodology is relatively single. In the future, it is necessary to expand the scope of the study, enrich the methodology, and further explore the development and application of digital teaching resources, so as to promote the teaching reform of college curriculum and cultivate talents who can meet the needs of the times.

Keywords

University teaching reform, digital transformation, teacher-student co-construction, PBL

1. Introduction

With the rapid development of information technology, digitalization has become an important feature of today's era. New technologies and teaching methods have brought unprecedented opportunities and challenges to the reform of college curriculum. Digital technology provides richer resources and more convenient tools for teaching, and at the same time puts forward higher requirements for teachers' teaching ability and students' learning style. Therefore, it is of great significance to study the teaching reform of college courses under the perspective of digital transformation. It explores the dilemmas and challenges of college curriculum teaching in the digital background, analyzes the current situation and

problems in the actual classroom teaching process, and searches for the path of college teaching reform that conforms to the background of the times, with a view to giving full play to the advantages of the digital era to cultivate high-quality talents.

2. Pedagogical Dilemmas and Challenges in Higher Education Programs

2.1 Limitations of Teaching Resources

Under the wave of the digital era, the rapid updating and explosive growth of knowledge has brought unprecedented challenges to the teaching of college courses. Teachers and students are faced with a difficult problem: how to sift and master the necessary parts from the vast amount of knowledge within a limited time. Teachers need to continuously update their knowledge system and improve their teaching ability, while helping students to improve their independent learning ability and information literacy, effectively utilize digital resources and enhance their learning efficiency.

The development of teaching materials is equally challenging. Traditional textbooks have a long development cycle, making it difficult to keep up with the pace of knowledge updating. Therefore, the development of teaching materials in the digital era must focus on timeliness and flexibility, and be prepared and updated through digital means to meet students' learning needs. For example, in econometrics courses, teachers can release the latest teaching materials and research results through online platforms to ensure that students have access to cutting-edge content in the discipline.

Although digital technology has made teaching resources richer and more varied, the lack of uniform standards and norms for the construction of digital teaching resources has led to uneven resource quality. Some teaching resources have outdated content, single form, lack of scientific and systematic, and are difficult to meet teaching needs. This not only affects the teaching effect and quality, but also limits the development of educational reform and innovation in universities. This requires us to strengthen the screening and management of teaching resources, formulate unified standards and norms, and improve the overall quality of resources. As well as optimize the online learning mode.

2.2 Teachers' Dilemmas and Challenges

With the development of digital technology, various new types of digital teaching tools and resources are emerging, and the demand for teachers' digital competence is increasing. Some teachers do not have sufficient mastery of digital technology, lack the ability to develop digital teaching resources, and have difficulty in effectively using new teaching tools and technologies such as online teaching platforms, multimedia software and data analysis tools, thus failing to give full play to the advantages of digital teaching technology and affecting the development of new teaching activities.

At the same time, the existing teaching evaluation system appears to be inadequate in digital teaching, with a single evaluation index and unscientific evaluation methods. The evaluation system of the online learning mode mainly evaluates the learning courses, contents and platform functions, and lacks scientific and systematic nature. It neglects the evaluation of learners and teachers, and the evaluation

form mostly adopts the traditional examination. This requires us to establish a more diversified and scientific evaluation system to improve the accuracy and effectiveness of evaluation.

In addition, the role of the teacher has been transformed in digital teaching, no longer as a mere transmitter of knowledge, but as a guide and facilitator of student learning. Teachers need to guide students to make use of digital resources for independent learning, and promote student inquiry and cooperation by asking driving questions and organizing group discussions and presentations in project-based learning to facilitate communication and learning. At the same time, they pay attention to students' emotional needs and create a positive learning atmosphere to stimulate students' interest and motivation in learning.

2.3 Dilemmas and Challenges for Students

In the digital age, students face a range of learning difficulties and challenges. The arrival of the information age requires students to have more flexible and diverse learning styles. Traditional classroom learning can no longer meet the demand, and students must learn to utilize online learning, mobile learning and other digital means for independent learning, and develop teamwork and communication skills. For example, in the econometrics course, students can learn independently through online platforms and then work in groups to complete projects, thus enhancing their knowledge and skills while developing teamwork skills.

Some students lack the motivation and self-discipline to effectively utilize online resources. Students need stronger independent learning skills and self-discipline to effectively utilize digital resources. It is also crucial to enhance students' information literacy so that they can accurately access, analyze and utilize information. Schools and teachers need to provide guidance and resources to help students develop self-directed learning skills, such as offering courses on learning strategies, providing checklists and guidelines on learning tasks, and encouraging students to actively explore and experiment.

3. Pathways to Pedagogical Innovation: The Case of an Econometrics Course

3.1 New Teaching Techniques and Tools

With the development of digital technology, new teaching techniques and tools for econometrics course teaching mode innovation provides a new path to realize the effective integration of the traditional classroom and digital technology means.

Rain Classroom is a tool that deeply integrates modern information technology with traditional classroom teaching. Teachers can release practice questions and questionnaires in the classroom, and students can answer them instantly through their cell phones. Teachers can see the students' answers in real time, including the correct rate, the speed of answering the questions, and the proportion of choices for each option, etc., so as to understand the degree of students' mastery of the knowledge point and correct and explain the students' errors in time, so as to improve the relevance and effectiveness of

classroom teaching. Students can send pop-ups on PPT through Rain Classroom to communicate with teachers in real time. They can ask questions, answer questions, or participate in classroom discussions. This kind of interaction breaks the one-way communication mode of the traditional classroom, which makes the classroom atmosphere more active and students' participation higher. Students can raise their confusion about their understanding of the model through the pop-up screen, and the teacher can answer them in time, while other students can see the questions and answers, which helps to share and disseminate knowledge.

The MOOC platform brings together high-quality course resources from universities and educational institutions around the world. Teachers can recommend relevant MOOC courses as a supplement to students' extracurricular learning, exposing students to different teaching styles and contents and broadening their horizons. Compared with traditional online course videos, students are more receptive to sharing video platforms, such as BILIBILI, and the content output of these types of videos will be more interesting and direct, and the fun and high efficiency attracts more students to choose to watch them, which improves students' interest in learning. At the same time, teachers can combine online course resources with offline classroom teaching to realize the blended teaching mode. For example, before classroom teaching, teachers can ask students to watch relevant MOOC videos or BILIBILI videos to preview the course content and understand the basic concepts and methods. In the classroom, the teacher can focus on the problems in the students' preview, and guide the students to think deeply and discuss. After class, students can watch the online video again to consolidate what they have learned and complete related assignments and exercises. This online-offline hybrid teaching mode can fully utilize the advantages of online and offline teaching and improve the teaching effect.

3.2 Project-based Learning

Project-based learning is a student-centered teaching methodology that enhances students' interest and participation in learning and develops their practical and innovative abilities by involving them in the design, implementation and evaluation of actual projects.

In an econometrics course, a project-based learning approach can be used in which students form groups and choose a real economic problem to study. Students need to collect data, build an econometric model, conduct empirical analysis and write a research report. In this process, teachers can give guidance and assistance to students and guide them to think and explore deeply.

For example, students can choose the project of "Analyzing the Influencing Factors of House Prices" for research. Students need to collect data on house prices and related economic indicators in different cities, set up an econometric model to analyze the relationship between house prices and economic indicators. Students can collect data through questionnaires, field research, etc., or use public data on the Internet for analysis. When building the econometric model, students need to choose appropriate econometric methods and software tools to estimate and test the model. Finally, students need to write a research report to present their findings and conclusions.

Project-based learning can significantly improve the teaching effect of econometrics courses. By participating in the research of actual projects, students can apply the knowledge of econometrics to practical problems and improve their practical ability and innovation ability. At the same time, project-based learning can also cultivate students' teamwork and communication skills, and improve their comprehensive quality.

For example, in the process of project-based learning, students need to share the work with their group members and work together to complete the research tasks of the project. In this process, students need to learn to communicate and coordinate, play to their strengths and work together to solve problems. Through project-based learning, students can not only improve their econometrics knowledge and skills, but also develop their teamwork and communication skills, laying a solid foundation for their future study and work.

3.3 Teacher-student Co-construction Model

Teacher-student co-construction is a new type of teaching mode, which emphasizes the joint participation of teachers and students in the design, implementation and assessment of the course to realize the mutual benefit of teaching and learning. In the econometrics course, the model of teacher-student co-construction can be adopted, so that teachers and students can jointly participate in the establishment of the course case database, as well as the construction and reform of the course.

For example, teachers can invite students to participate in the formulation of the course syllabus and the selection of teaching content, so that students can make suggestions and comments according to their needs and interests. Teachers can adjust the teaching content and methods according to students' feedback to improve the relevance and effectiveness of teaching. At the same time, teachers can also invite students to participate in the teaching activities of the course, such as self-constructed case bank, class discussion, case analysis, project research, etc., so that students can learn through participation and improve their learning interest and participation.

Faculty-student co-construction is important for teaching econometrics courses. Teacher-student co-construction can improve the teaching quality of the course. Through the joint participation of teachers and students, the teaching content and methods of the course are more in line with the needs and interests of students, and the teaching effect is more significant. It can also promote the professional development of teachers. In the interaction with students, teachers can understand students' learning needs and confusions, continuously improve their teaching methods and means, and improve their teaching level. It can also cultivate students' innovative ability and practical ability. In the process of participating in the construction and reform of the curriculum, students can utilize their own initiative, put forward new ideas and suggestions, and cultivate their innovative and practical abilities.

3.4 The Case of an Econometrics Course

Adhere to the teaching guiding ideology that gives top priority to moral education, focuses on teaching, and takes educating people as the foundation. Establish a modern curriculum concept and build a curriculum system composed of three parts: disciplinary courses, activity courses, and hidden courses. Strive to achieve the coordinated development of knowledge and abilities, the close combination of in-class and out-of-class learning, and the close connection between learning and life, so as to stimulate students' interest in learning and realize the teaching objectives at the three levels of knowledge, ability, and quality in the econometrics course.

Theoretical teaching is mainly adopted, supplemented by the Project-Based Learning (PBL) teaching method and group cooperation. There are 3 to 4 students in each group, and group learning based on special projects is carried out. A special topic that matches the actual economic life and current affairs hotspots is studied and discussed, and a group research report is generated as an assignment.

EViews and Stata are used as experimental teaching tools. Besides, the multimedia teaching tool-Rain Classroom is used as an auxiliary to increase the interaction between teachers and students. Course materials and reference documents are uploaded before class to remind students to preview. During class, the feedback on students' mastery of knowledge points can be obtained in a timely manner through the correct rate of practice questions. After class, teaching reflection is conducted by using the statistics of classroom data.

Combined with the nature and characteristics of econometrics, teaching is carried out according the idea of "online autonomous learning before class → thinking and explanation during class → homework modeling practice after class".

4. Discussion

4.1 Research Summary

Digital technology has brought rich teaching resources and convenient teaching tools to the teaching of college courses and promoted the transformation of the teaching mode. The development of digital resources such as online courses and multimedia materials has provided students with richer and more diversified learning options. The application of new teaching modes such as blended teaching and flipped classroom has improved the teaching effect and students' learning interest. Higher education curriculum teaching is faced with the challenges of knowledge explosion and transformation of learning styles in the context of digitization. The increase in the amount of knowledge and the speed of knowledge updating have brought great pressure to teachers and students. At the same time, the impact of deep learning and the transformation of learning styles require students to have more flexible and diversified learning styles.

The application of new teaching technology means in colleges and universities has improved the sharing of teaching resources and the interactivity of teaching sessions. Application modes such as multimedia teaching and network teaching provide students with a more vivid, visual and convenient way of learning. The practice of teaching methods in the classroom of econometrics has shown that teaching methods such as project-based learning and teacher-student co-construction can improve students' practical ability and innovation ability and promote teaching and learning.

4.2 Research Limitations and Perspectives

Although this paper provides a more in-depth discussion on the teaching reform of college courses under the perspective of digital transformation, there are still some limitations. First, the research scope is limited. This study mainly explores the econometrics course as an example, although the econometrics course can represent the general situation of college courses to a certain extent, there are still differences between courses of different disciplines, and it may not be able to completely cover the characteristics and needs of all courses. Secondly, the research method is relatively single. This study mainly adopts the methods of literature review and case study analysis, and lacks empirical research and data support for a large number of samples. This may lead to a certain impact on the accuracy and generalizability of the research findings.

Future research can further expand the scope of the study to conduct a more comprehensive study of courses in different disciplines, including courses in various fields such as liberal arts, science, engineering, etc., in order to gain a more comprehensive understanding of college courses in digital transformation and put forward more pervasive reform proposals. Meanwhile, research methods are enriched, and a combination of multiple research methods, such as questionnaire surveys and experimental studies, are used to obtain a large amount of empirical data and improve the accuracy and universality of the research conclusions. At the same time, long-term tracking research can be used to understand the effects of teaching reform measures at different time stages, so as to better adjust and improve the teaching reform program.

The development and application of digital teaching resources can be further explored in the future. Strengthen the construction of online courses, multimedia materials and other digital resources, and improve the quality and quantity of resources. At the same time, explore the mode and method of application of digital resources in teaching to improve the teaching effect. Conduct in-depth research on learning modes adapted to the digital era. Pay attention to the development of new learning modes such as in-depth learning and mobile learning, and explore learning modes and teaching methods that suit students' needs. Strengthen the integration of new teaching technology means and traditional teaching methods. Combine the advantages of traditional teaching methods while giving full play to the advantages of new teaching technology means to improve teaching quality. Continuously promote the innovation of teaching methods in the classroom of econometrics. Continuously explore the practical application of project-based learning, teacher-student co-construction and other teaching methods,

summarize experience and promote successful cases.

In short, digital transformation brings opportunities and challenges for college curriculum teaching. The reform of college curriculum teaching in the context of digitalization is a long-term and arduous task. We need to constantly explore and innovate, make full use of the advantages of digital technology, improve the quality of teaching, and cultivate high-quality talents to meet the needs of the times.

References

Fang, Y. M. (2023). Logic and Promotion Strategy of Teacher Education Governance under the Background of Digital Transformation. *Educational Academic Monthly*, *2023*(5), 40-46.

Feng, L. X., Li, Z. H., & Li, R. X. (2023). Exploration of Building an Academic Community in Teaching under the Background of Local Undergraduate University Transformation. *Higher Education Forum*, *2023*(9), 40-44.

Liu, H. R. (2022). Exploration of Teacher Teaching Ability Development Based on Teaching Academic Community. *Education and Teaching Forum*, *2022*(14), 1-5.

Xie, P. C., Zhang, Y. P., & Wang, J. H. (2023). Exploration of the Integrated Construction of Smart Horse Racecourse in Universities from the Perspective of Digital Education Transformation. *Time Report (Benliu)*, *2023*(7), 155-157.

Yan, J. Y., Huang, S., & Guo, J. M. (2022). Research on the Construction of the Mechanism for the Development of Academic Teaching Abilities of University Teachers, thesis. *Modern University Education*, *38*(3), 102-110.

Zhu, R. (2023). Research on Building Leadership of University Teachers from the Perspective of Academic Community. *Journal of Jilin University of Chemical Technology*, *40*(2), 59-62.